

**ABSTRACT OF THE DISCLOSURE**

A catalyst component for addition polymerization  
5 containing (A) a compound containing an atom of the Group  
II to the Group XII or Lanthanide series in which the  
lowest energy level of unoccupied molecular orbital  
having the valence p-type atomic orbital of the atom of  
the Group II to the Group XII or Lanthanide series as  
10 a main component, wherein the coefficient represented  
by a linear combination, is 0.4 or more) is calculated  
to be 0.008 atomic unit (Hartree) or less by the  
calculation of density functional method (B3LYP/3-21G  
level), a catalyst for addition polymerization  
15 containing the same, and a process for producing an  
addition polymer with the catalyst.